L B
12
Nat Hist

The Coleopterists' Bulletin

Volume VII APRIL, 1953 No. 2

Published bimonthly beginning with February by Sherwood House, Publishers, P. O. Box 855, Washington 4, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Sherwood House. Back numbers are available. All correspondence should be addressed to Box 855, Washington 4, D. C.

The general policies of The Coleopterists' Bulletin are determined on the recommendation of the following Advisory Board: Dr. Ross H. Arnett, Jr., U. S. Department of Agriculture (Manager); Dr. Richard E. Blackwelder, U. S. National Museum (Editor); Dr. P. J. Darlington, Jr., Museum of Comparative Zoology; Dr. Henry Dietrich, Cornell University; Dr. J. Gordon Edwards, San Jose State College.

Manuscripts dealing with any phase of the study of beetles, including descriptive material, are invited.

Entered as second-class matter at the post office at Washington, D. C.

THE LIBRARY OF THE
MAY 4 1953
UNIVERSITY OF ILLINOIS

MAY 5 1953

OBSERVATIONS ON THE BIOLOGY OF PSOA MACULATA LECONTE (PSOIDAE)

By J. W. Tilden

San Jose State College, California

This species is found breeding commonly in dying wood of *Baccharis pilularis* De Candolle. More than one hundred specimens were reared from material taken at Alum Rock Park, Santa Clara County, California, on February 23, 1947. The infestation was heavy, many larvae and pupae being found in a single stem. The wood had been eaten so completely that sticks up to one inch in diameter could be broken easily between the fingers.

Most of the infested limbs were ones that had been broken down by some mechanical means but which remained attached by a small part to the bushes. This circumstance insured that the drying of the branches had been slow. Such a condition is favorable to the breeding of this beetle. Nearby shrubs killed slowly by being partly buried by a landslide were also heavily infested. There seems to be no evidence that this species attacks healthy living plants, but rather that attacks are confined to weakened, declining, and slowly dying bushes.

In addition to reared material, numerous specimens were taken in the field by beating on *Baccharis* plants. Laboratory-reared material emerged in March, the earliest date March 2, but material taken in the field ranged in dates from March through May.

Adults are active and nervous, flying readily. Males average smaller than females, and are carried by the females in copula-

NAT. HIST.

tion. Pairs confined in test tubes mated frequently. During copulation the "ovipositor" (actually the telescoped terminal abdominal segments) is withdrawn, and the sternite of the fifth segment is relaxed and moves forward, allowing the genitalia of the male to enter. Often the male tries without success to copulate, the female not relaxing the fifth sternite. Copulation was timed on three occasions and was found to be 42 minutes, 57 minutes and 90 minutes respectively in these three cases. Observation was on pairs isolated in thin glass tubes, by means of binocular microscope.

Females mated on March 3 produced eggs on March 7, four days later. Four gravid females laid 71 eggs between noon, March 7, and 9 a.m. March 8, after being placed on suitable wood which did not shelter previously laid eggs, an average of almost 18 eggs per female in 21 hours. Other matings showed that four days was a normal lapse of time between mating and oviposition. Total egg production of laboratory females was not high, about 37 eggs per female. Females lived from 12 to 14 days in the laboratory, while males averaged 7 to 10 days. No doubt the insects live longer in a natural state, but no method was devised for keeping them alive longer in the laboratory. The adults feed but little on the foliage of the plant, and the food of the adults was not found. Water was taken readily from moist sand or from droplets on leaves.

The eggs average 1.2 mm. in length, and are covered by a very thin flexible chorion, of a whitish color. They are equipped with a slender pointed projection which varies in length in different eggs, but which measures on the average about 0.2 mm. in length. This projection is terminal in the horizontal axis of the egg, and its function was not found. However, in eggs preserved in 70% alchohol, a protoplasmic connection was seen to extend into this projecting process. The chorion is apparently smooth under magnification up to 30 diameters, and shrivels when the egg dries. A moderate amount of desiccation seems to have no ill effect upon the viability of the egg. Eggs isolated in small vials and allowed to dry, shriveled appreciably but hatched as soon as eggs left in the original site of oviposition.

Eggs are laid on either very dead wood or upon fresh-cut wood that has been allowed to stand for several days. Fresh-cut wood is not at once attractive to the females. *Baccharis* wood that has been allowed to stand for several days after cutting develops an aromatic odor that may be the atrahent. The fact that very fresh wood is not attractive to females is in keeping with the observation that the healthy plants are not attacked. However, field observations seem to indicate that eggs laid on completely dead wood do not succeed, while those laid on dying wood do.

Eggs may be deposited either in cracks in the bark or in axils of small branches, and are usually well concealed. The ovipositor is remarkably extensile. Eggs were found inserted under loose bark to a distance of 3.5 mm., measuring from the loose edge. Since adult beetles measure but 6 to 10 mm. in length, it appears that the ovipositor can be extended from one-third to one-half the length of the body. It should be remembered that the ovipositor, so called, of these beetles is in reality the extensible terminal abdominal segments.

Eggs laid on March 10 hatched on March 24. Few sterile eggs were noted. The larvae eclose from the egg by eating away the chorion from the side of the egg that is free of the wood surface. Since the eggs lie on their sides, the larvae thus eclose somewhere on the periphery of the short axis of the eggs. The remaining chorion is not eaten by the larva, which wanders away and soon gains entry to the wood by means of small cracks in its surface. The larva does not go from the egg directly into the food supply, but comes out on the surface and then enters the wood. Those eggs laid on smooth surfaces seem to have a high mortality rate for the larvae, since these larvae are in poor position to enter the wood. The newly hatched larvae are scarabaeiform and poorly adapted to movement on open surfaces. Most of the exposed larvae soon lost footing and fell to the bottom of the containers.

It was not found possible to duplicate in the laboratory the slow drying of the wood in which larvae develop in the field. Old wood from which adults had issued, while oviposited upon, was not suitable for larval development, and larvae that hatched on it soon died, seemingly from starvation, since they became thin and emaciated before completing the first instar. Freshly-cut wood dried too rapidly and soon became very hard, and the larvae completed but two instars, then apparently found the wood too hard to eat, and soon also died.

From field observations it is possible to reconstruct most of the life history. Infested wood examined in July showed only immature larvae, but wood examined in early winter and again in the early spring, showed both mature larvae and pupae. Mature larvae that pupated in the laboratory emerged after a pupal period of about 21 days. From this it is concluded that eggs laid in the early spring hatch in about two weeks, that the larvae feed for about ten months and mature in a single year. Two parasites were reared: *Cryptohelcostizus alamedensis* (Ashmead), and *Eubadizon* sp. Thanks are due Mr. C. F. W. Muesebeck and Dr. H. K. Townes, for the determination of the parasites.

Because *Psoa maculata* LeC. confines its activities to dying or dead plants, it cannot be regarded as injurious to the host plant. Ecologically, its services in reducing these plants is a useful one. It is the only beetle associated with *Baccharis pilularis* that appears to have this particular role.

A NEW BEMBIDION (CARABIDAE) OF ZOOGEOGRAPHIC INTEREST FROM THE SOUTHWEST PACIFIC

By P. J. Darlington, Jr.

Museum of Comparative Zoölogy, Cambridge, Mass.

The new *Bembidion* described below comes from a remote part of the world, from the tropical island of Morotai in the Moluccas not far northwest of the ''Bird's Head'' of New Guinea, but nevertheless it has a significance for coleopterists even in North America. It is an example of what is probably a very common thing: an insect from a distant country which may help toward an understanding of something in our own fuana.

The new species belongs to a group, now usually considered a subgenus of *Bembidion*, called *Cillenus* Samouelle. The group in a broad sense (including *Armatocillenus* Dupuis and *Chinocillenus* Netolitsky) is rather diverse in some ways but is characterized by a very large head, long mandibles, deep posterior transverse sulcus of pronotum, and well developed marginal elytral channels. The species of the group have been reviewed by Andrewes (Proc. Roy. Ent. Soc. London, series B, vol. 7, 190-196, 1938). Most of them, in fact all of which the habitat has